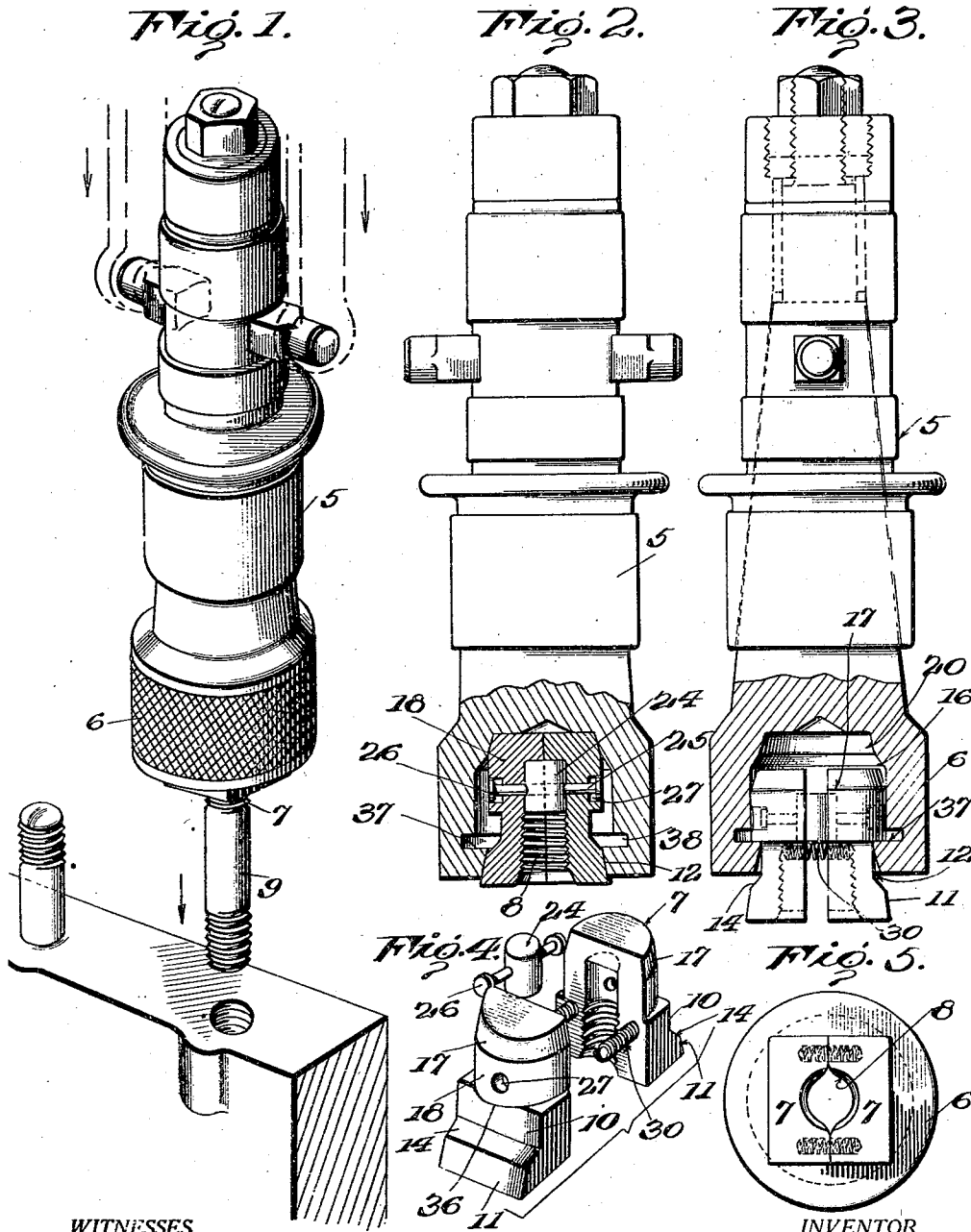


July 1, 1924.

1,499,701

L. SKEEL
STUD DRIVER

Filed June 20, 1923



WITNESSES

INVENTOR

W.A. Williams.

Lewis Skeel.
BY *Mum & Co.*

J. G. Quesada

ATTORNEYS

Patented July 1, 1924.

1,499,701

UNITED STATES PATENT OFFICE.

LEWIS SKEEL, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR TO McCROSKEY TOOL CORPORATION, OF MEADVILLE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

STUD DRIVER.

Application filed June 20, 1923. Serial No. 646,629.

To all whom it may concern:

Be it known that I, LEWIS SKEEL, a citizen of the United States, and resident of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Stud Drivers, of which the following is a specification.

This invention relates to stud setters especially adapted for use in driving studs into castings and the like.

An important object of this invention is to provide a stud setter having simple means whereby the driving connection between the same and the stud may be established or broken without stopping or reversing the machine to which the stud setter is attached.

A further object is to provide a stud driver wherein the lateral thrust on the gripping jaws when the stud bottoms or is driven home is utilized to assist the breaking of the driving connection between the stud driver and the stud.

A further and equally important object is to provide a stud driver having simple means whereby the gripping jaws may be instantly removed and jaws of another size substituted, all without removing bolts or other fastening devices and without the aid of tools.

Also the invention forming the subject matter of this application aims to provide a stud driver which is characterized by its extreme simplicity, durability and cheapness of manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a perspective of the improved stud driver in use.

Figure 2 is a side elevation of the same, the lower portion of the stud driver being shown in section to illustrate the jaws in their operative positions.

Figure 3 is a side elevation of the improved stud driver, the lower portion of the stud driver being shown in section to illustrate the jaws in their receptive or inoperative positions.

Figure 4 is a group perspective illustrating the jaws and associated elements.

Figure 5 is an end elevation of the improved stud driver.

In the drawing wherein for the purpose of illustration is shown a preferred embodiment of the invention the numeral 5 generally designates a friction drive member of any suitable type and by reference to Figures 2 and 3 it will be seen that the forward portion of the member 5 is formed with an enlargement 6 having a socket for the reception of a pair of gripping jaws 7.

The opposed sides of the jaws 7 are provided with longitudinal semi-circular grooves 8 which cooperate in the formation of a socket for the reception of a stud 9. Of course the walls of the semi-circular grooves 8 are threaded for engagement with the threads of the stud so that a positive driving connection is provided between the jaws and the stud.

Figure 4 clearly illustrates that the forward portions of the jaws are provided with transversely inclined flat faces 10 and 11, the faces 10 being engaged with the flattened wall 12 of the socket when the jaws are in their advanced or stud receiving positions. When the jaws are in their operative or stud gripping position as illustrated in Figure 2, the faces 11 are flatly in engagement with the faces 12 whereby a positive driving connection is provided between the driving member and the jaws. As the faces 10 are flatly in engagement with the faces 12 when the jaws are in their inoperative positions the jaws are caused to rotate with the driving member so that the jaws are always in a position to freely enter the socket as illustrated in Figure 2. It might be said that a constant driving connection is provided between the jaws and the driving member regardless of the positions of the jaws.

Transversely inclined shoulders 14 are formed on the outer sides of the jaws 7 between the faces 10 and 11 and as the jaws are being moved rearwardly by a means to be described the inclined shoulders will contact with the driving faces 12 and thereby move the jaws inwardly or together. When the shoulders 14 pass the inclined faces 12 the driving faces 11 will be flatly presented to the driving faces 12, so that the jaws are moved closer together. It will be seen with reference to Figures 2 and 3 that the faces 11 and 12 are slightly inclined with respect to the longitudinal axis of the tool.

The slight transverse inclination of the driving faces 11 and 12 prevents binding between the jaws and the driving members as the result of the lateral pressure exerted by the stud when the latter is bottomed or is driven home. In explaining this point it might be stated that when the stud is bottomed or when it reached home there is a strong tendency of the threads on the jaws to ride over the threads on the stud and therefore a strong lateral pressure is exerted on the jaws. If the driving faces 11 and 12 extended parallel to the longitudinal axis of the tool this lateral pressure would cause the jaws to bind to the driving member and would prevent the release of the jaws from the driving member.

The socket in the driving member is formed adjacent its rear end with an annular inclined shoulder 16 arranged in the path of travel of the several contact portions 17 of the shanks 18 of the jaws, the said shanks being semi-cylindrical. In use the beveled portions 17 will contact with the shoulders 16 simultaneously with the engagement of the shoulder 14 with the driving faces 12 so that both ends of the jaws will be moved inwardly together. When the beveled portions 17 pass the shoulder 16 they will enter the reduced rear end of the socket and flatly contact with the inclined side wall 20 of the reduced rear portion of the socket. By inclining the portions 17 and 20 the rear portions of the jaws are prevented from binding as a result of the lateral pressure resulting from the bottoming of the stud.

Figures 2 and 4 clearly illustrate that a contact head 24 of cylindrical formation is arranged in the rear portions of the groove 8 and is mounted upon the intermediate portion of a jaw connecting pin 25. The terminal portions of the pins 24 are enlarged as indicated at 26 to provide disk-shaped stop elements located in recesses 27 in the outer faces of the shanks 18. By this means the separation of the jaws is limited and the movement of one jaw longitudinally with respect to the other jaw is prevented. It will be observed that the rear end of the contact head 24 is flatly in contact with the rear ends of the grooves 8 so that the end thrust on the head 24 is not borne by the pin 25.

The jaws are urged to their stud receiving positions by gravity and by springs 30 received in sockets in the opposite sides of the jaws and of course when a stud is introduced into the socket formed by the jaws the jaws will be moved rearwardly and together against the tension of the springs 30.

In operation jaws of a desired size are inserted into the socket in the forward end of the friction driving member 5 and a stud is subsequently introduced into the socket

formed by the jaws. The engagement of the stud with the head 24 will move the jaws rearwardly so that the inclined portions 17 will contact with the shoulder 16 simultaneously with the engagement of the straight shoulder 14 with the driving faces 12 whereby the threads on the inner sides of the jaws are engaged with the threads on the stud. The subsequent rotation of the driving member results in driving home or bottoming the stud and when the resistance is increased beyond a predetermined point the driving member will slip. The driving member is now withdrawn or moved rearwardly without stopping the machine and without reversing and the jaws will by their engagement with the threads on the stud be returned to the position illustrated in Figure 3. The inclined contact faces 17, 20 and 11 and 12 will effectively prevent binding of the parts.

The rounded shanks 18 are extended beyond the straight faces 10 to define shoulders 36 which rest upon a pair of parallel stop shoulders 37 in the forward portion of the socket in the driving member. Figure 2 illustrates that the forward portion of the socket in the driving member is formed with an annular groove 38, the lower wall of which is extended inwardly beyond the upper wall thereof to define the stop shoulders 37 arranged in the path of travel of the shoulders 36.

In use the loss of any of the parts is absolutely prevented due to the stop shoulders 36 and 37. However when it is desired to detach the jaws for substitution of jaws of another size the jaws are merely pressed together by one's hand so that the shoulders 36 will clear the shoulders 37. Of course the removal of the jaws 7 will also accomplish the removal of the head 24, the pin 25 and spring 30 so that a new set of jaws and associated elements may be quickly inserted.

One of the principal features of the invention resides in the quick releasing means by which the tool may be disconnected from the stud when the stud has been driven home or bottomed. It will also be seen in summarizing that the direct drive between the driving member and the jaws greatly reduces the number of parts necessary. Furthermore the fact that the tool may continue to rotate in the same direction during the disconnection of the stud therefrom adds greatly to the desirability of the invention.

I claim:—

1. A stud setter comprising a friction drive member having a socket provided with flat inclined driving faces, and jaws received in said socket and having flat inclined faces adapted for flatly contacting with the driving faces, whereby a direct driving connection is established between

the driving member and the jaws, said jaws being formed with threads for engagement by the threads of a stud.

2. A stud setter comprising a drive member having a socket provided with flat inclined driving faces, and stud engaging threads, jaws received in said socket and having flat inclined faces adapted for flatly contacting with the driving faces, whereby a direct driving connection is established between the driving member and the jaws, there being means whereby the flat face of each jaw is maintained in a plane substantially parallel to the plane of the associated driving face when the jaws are in their advanced receptive positions.

3. A stud setter comprising a drive member having a socket provided with flat inclined driving faces, jaws received in said socket and having flat inclined faces adapted for flatly contracting with the driving faces, whereby a direct driving connection is established between the driving member and the jaws, and a contact head confined between the jaws and having a connecting pin extended through the jaws and having its ends enlarged to constitute stop elements adapted to limit the separation of the jaws, said pin being entirely within said jaws and being free from connection with said drive member whereby said jaws and said pin may be removed as a unit.

4. The construction set forth in claim 3, and springs confined between the opposed sides of the jaws and urging the same to their separated positions.

5. A stud driver comprising a driving member having a socket provided in its opposite sides with flat inclined driving faces, jaws received in said socket and having inclined faces adapted for contacting with said first named inclined faces whereby a positive and direct driving connection is established between the driving member and the jaws, one end of the jaws being formed with shanks, the outer sides of which are rounded and are extended beyond the adjacent portions of the jaws to form shoulders, the wall of the socket being provided with a groove, one wall of which is extended beyond the opposite wall of the groove to define a stop shoulder arranged in the path of travel of the shoulders on said shanks, and a contact head confined between the jaws and having a pin extended through the jaws and provided with means limiting separation of the same.

6. A stud driving member comprising a body having a socket, the rear portion of which is formed with an inclined wall, jaws received in said socket and having shanks, one end of which is slightly beveled for engagement with said inclined wall, said socket being provided in advance of said wall with a contact shoulder arranged in the

path of travel of said beveled portions of said shanks whereby to urge the jaws together as the same are moved rearwardly, coiled springs confined between the jaws, and a connecting pin joining said jaws and being free from connection with said driving member whereby said jaws, pin and springs may be removed or inserted as a unit.

7. A stud driving member comprising a body having a socket, the rear portion of which is formed with an inclined wall, jaws received in said socket and having shanks, one end of which is slightly beveled for engagement with said inclined wall, said socket being provided in advance of said wall with an annular contact shoulder arranged in the path of travel of said beveled portions of said shanks whereby to urge the jaws together as the same are moved rearwardly, springs confined between the jaws, the forward portion of the socket being provided in opposite sides with inclined driving faces and the jaws being provided with correspondingly inclined faces adapted to contact with said first named inclined faces.

8. A stud driving member comprising a body having a socket, the rear portion of which is formed with an inclined wall, jaws received in said socket and having shanks, one end of which is slightly beveled for engagement with said inclined wall, said socket being provided in advance of said wall with an annular contact shoulder arranged in the path of travel of said beveled portions of said shanks whereby to urge the jaws together as the same are moved rearwardly, coiled springs confined between the jaws, the forward portion of the socket being provided with oppositely located inclined driving faces and the jaws being provided with correspondingly inclined faces adapted to contact with said first named inclined faces, and a contact head confined between said shanks and having a connecting pin extending through the shanks and provided with means limiting separation of the same, said pin being free from connection with said driving member and being carried by said jaws, whereby the jaws and the joints may be removed as a unit.

9. A stud driving member comprising a body having a socket, the inner portion of which is formed with a slightly inclined wall and an annular shoulder, jaws received in said socket and having shanks provided with beveled portions adapted to engage said annular shoulder whereby the jaws are moved together, means limiting the separation of the jaws and being free from connection with said driving member, the outer portion of the socket and the outer sides of the jaws being provided with inclined driving faces adapted to flatly contact with each other, the jaws being provided intermediate its

ends with flat contact faces adapted to engage the driving faces on the wall of the socket when the jaws are advanced.

10. The construction set forth in claim 9, 5 said jaws being provided between the first and second named faces thereon with shoulders adapted to contact with the inclined faces on the wall of the socket whereby the jaws are moved together.

10 11. A stud driving tool comprising a friction drive member having a socket provided with oppositely located flat inclined driving faces, jaws received in said socket and having flat inclined driving faces adapted to 15 contact with said first named driving faces, the jaws being provided inwardly of the faces thereon with a second set of faces adapted to contact with the faces on the wall

of the socket whereby the jaws are rotated with the friction drive member when the 20 jaws are advanced, the inner portions of said jaws being provided with shanks, portions of which are extended beyond the adjacent portions of the jaws to define shoulders, the wall of said socket being provided 25 with a stop shoulder in the path of travel of said shoulder, the inner portion of said socket being provided with an annular shoulder arranged in the path of travel of the inner portions of said shanks whereby 30 to move the shanks together as the same are moved inwardly, and means limiting the separation of the jaws and being free from connection with said driving member.

LEWIS SKEEL.